EVALUATION OF VARIOUS MARKETING ASPECTS IN SELECTED SECTORS Of THE ELECTRONICS INDUSTRY

by

Teresa Pek-Yun Wong
黃碧茵

MBA PROJECT REPORT

Presented to

The Graduate School

In Partial Fulfilment

of the Requirements for the Degree of
MASTER OF BUSINESS ADMINITRATION

THREE-YEAR MBA PROGRAMME

THE CHINESE UNIVERSITY OF HONG KONG

May 1991

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CHAPTER I

INTRODUCTION

General Overview

The electronics industry was first introduced into Hong Kong between the late sixties and the early seventies. It started off as a supportive manufacturing center (that is performing part of the manufacturing processes for large, mainly overseas, manufacturers) and OEM (original equipment manufacturing) manufacturer of simple products and gradually developed into one of the major industries in Hong Kong.

At present, the major industries in Hong Kong include textiles and clothings (it makes up about 40 percent of Hong Kong's export), electronics (about 23 percent of Hong Kong's export), plastics (about 6 percent of Hong Kong's export) plus watches and clocks (about 8 percent of Hong Kong's export).[1] Among these industries, the electronics industry has actually gained the highest percentage of growth in share of Hong Kong's export (see Appendix I). In 1988, there are altogether 864 establishments manufacturing electrical and electronic consumer products with 67,467 employees engaged in the industry (There were a total of 51,671 establishments and 885,963 persons engaged in the manufacturing sector in 1988.[2])

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1. Percentages calculated from Table 14 and Table 18 in Hong Kong Trade Statistics, Domestic Exports and Re-exports, Hong Kong: Census and Statistics Department, August 1990.

2. 1988 Survey of Industrial Production, Hong Kong: Census and Statistics Department, Table 19, pp. 52-53.

Electronics manufacturers in Hong Kong can be roughly grouped into ten categories according to the product they produce. These ten categories are:

1. Audio-Visual equipments including radio, television, Hi- Fi, tape recorders; etc (ISIC 761, 762, and 763 plus all types of headphones, earphones, and loudspeakers)
2. Computer equipments including personal computers, work stations and peripherals like printers, monitors, and keyboards (ISIC 752)
3. Communication equipments (Including telecommunication equipments like telephone and data communication equipments like modems and network products. ISIC 764, excluding all types of headphones, earphones, and loudspeakers)
4. Electronic toys/games (including TV games, hand held games, children's educational games, etc)
5. Small electrical and electronic appliances; for example, coffee maker, electric fans, and hair dryer (ISIC 775)
6. Electronic clocks and watches
7. Other office automation equipment (ISIC 751, including pocket calculators)
8. Lighting equipment (including ballasts and lamps)
9. Electronic controlled home security systems
10. Parts and components (including printed circuit board, electronic components, etc)

The radio industry is one of the earliest to enter Hong Kong among the electronics industries. Low end pocket radio was the major product. As the electronics industry began to take root in Hong Kong and with new developments, more sophisticated products started to be produced in Hong Kong. Among the audio equipments are the cassette recorders, portable and

non-portable, and Hi- Fi equipments. Television or television related products, like video cassette recorders took a much longer time before it was finally established in Hong Kong. It was not until more recent years that television products manufactured in Hong Kong are recognized by the users.

Electrical or electronic household appliances manufacturing has also been established in Hong Kong for some time. They are basically OEM products bearing the name of more well known suppliers like Philips. Manufacturers in this area focus mainly on small appliances (for example, coffee makers and food processors) because it is much more difficult to support the manufacturing of larger appliance, like refrigerator, in Hong Kong.

The hot item in Hong Kong's electronics industry in the late seventies was the hand held electronic games. However, this product does not have a very long life cycle. With the decline of this product in the early eighties, TV games took its place. Actually, the electronic toys industry in Hong Kong does not only produce computer games. They offer a wide variety of products including remote control cars and ships, talking dolls, children's educational games, and a lot more. As Hong Kong has been long famous for being a toys manufacturer, it is easily understandable why her electronic toys can gain a place in the world market.

With the advance in technology, computer became more and more popular all over the world. The introduction of the personal computer opened up a brand new market for Hong Kong's electronics industry. Local manufacturers started off as the OEM suppliers. They produced low end models for large overseas computer companies and most of their output were exported. As the people in this industry gain more experience, they started to design their own models and market them locally. The success in this move was helped by the fact that personal computer gained wide acceptance in this city with high speed. With the computer, it came the peripherals. The personal computer on its own can have very limited usage. Users need at least a

monitor and a keyboard, and very often a printer to complete his terminal. Eventually, locally designed and manufactured computer equipments are sold both in the domestic market as well as overseas under their own brand name.

The telecommunication industry has been in Hong Kong for at least as long as the computer industry if not longer. At first, only basic telephone units were produced. Then came the feature phone which has a lot of functions integrated into the unit (for example, some telephone units have built in answering machines). Now, communication is not only limited to voice communication. Data communication is what every body is talking about. Data communication involves the transmission of all kinds of data (not only voice but all sorts of information; for example, computer files, messages, and video images) from one station to another (for example, from one computer to another remotely located computer). This kind of communication involves a complex data communication network which is built up with a lot of sophisticated and specific equipments. Hong Kong started late in this industry (in the manufacturing of this kind of equipment but not in its usage) but is trying to catch up.

Problems Facing the Electronics Industry

Hong Kong has benefited from a relatively low wage rate and easy access to technology in the past few decades. This has helped to build up Hong Kong's electronics industry. But with the passage of time, situation has changed and new problem arises. Following are some of the major problems that the electronics industry is facing:

1. It is an industry which relies very much on technology. The willingness of manufacturers to invest in research and development plays an important role in determining the future of the industry. Such investment is very large and is usually beyond the ability of individual manufacturers.
2. Problems which affect the entire Hong Kong definitely hurts this industry as well. These problems include political instability, brain drain, and the general increase in wages.
3. A significant percentage of engineers are leaving this field. As a result, the industry lacks technical support.
4. Protectionism in the European countries is also heightening. These countries realized that they are lagging behind in the electronics industry and are trying hard to catch up with various means including imposing stringent import regulations/quotas on the import of electronic goods.
5. In the past year, Hong Kong electronics manufacturers has been receiving less orders from customers because of the economic downturn.

Statement of Problem

In this research report, we will study the various marketing aspects of the electronics industry from an investor's point of view. Assuming that the investor has HK$ 1 million, which sector should he invest in?

Although there are ten sectors in the industry, only the audio-visual industry, the computer industry, the communication equipments industry, the electronic toys industry and the household appliance industry will be considered. These five sectors are chosen simply because of the interest of the author. Furthermore, each sector can be subdivided into smaller groups according to the product they produce. Only the more popular groups of products will be included in this study. Various marketing aspects of each sector will be discussed. These include:

1. A general overview of the industry.
2. Barrier to enter the industry.
3. Competition within each sector.
4. Profitability of each sector.
5. Future trend of the industry.
6. Problems or difficulties that the industry is facing.

After we have gone through these evaluations, we will determine the industry which we would like to invest in.

Research Methodology

Purposive convenience sampling was used in this research. Interview (in person or by telephone) was carried out to collect data for this project. Manufacturers in relevant industry were chosen (by convenience), and structured interviews were conducted with senior personnels (preferably in the marketing area) of these companies. Data collected are used as the background material for analyzing the situation. Government statistics are also used to support the arguments.

The following personnel has been interviewed to gather information regarding the industry that they are engaged in:

1. Mr. Chan of FormoTech which is in the audio-visual industry.
2. Mr. Ho of Eastern Electronics Co. This company is in the audio equipment industry.
3. Mr. Li of Hong Kong Telecom. At present, Mr Li is working in the telecommunications field. Formerly, he was engaged in the computer business.
4. Mr. Lee of Silver Manufactory Co.. Mr. Lee is in the electronic toys industry.
5. Mr. Wong of Linear HK Manufacturing Ltd.. Linear is a company which produces a wide variety of products. Before Mr. Wong joined Linear, he was engaged in the production of electronics household appliances.
6. Mr. Li of Video Technology Electronics Ltd.. Video Technology has a wide product range including computers, telecommunications equipments, toys; etc. Among all these, Video Technology is especially famous for educational toys.

7. Mr. Teo of Holien Holding Co.. Holien is a public company engaged in a diversified range of business. In the manufacturing sector of the company, Holien focuses in electronic toys and telephone manufacturing.

Questions surrounding the following areas were asked during the interviews:

1. General characteristics of the industry that they are engaged in.
2. Production requirements.
3. Competition from within Hong Kong as well as from overseas.
4. Barriers to entry including capital requirement, government regulations, product differentiation, customer loyalty, and the effect of economies of scale of the industry.
5. Profit margin of their products.
6. Outlook and future trend of individual industry.
7. Problems or difficulties constraining the individual industry.

Answers to these questions were recorded and utilized as the foundation of this research report.

CHAPTER II

AN OVERVIEW OF EACH SECTOR

Audio Visual Industry

Audio equipment manufacturing is among the earliest of the electronics industries to enter Hong Kong. It started off with low end pocket radio and gradually shifted towards higher end models. Included in this category are products like pocket radio, portable radio, clock radio, cassettes recorder/player (including walkman), car radio, mini combo, Hi-Fi, and all types of headphones and earphones (Of course there are other products which should be included in this category. For example, CD player, discman, sophisticated equipments like mixer, equalizer; etc, which Hong Kong does not have the ability to produce.) In this report, we will exclude headphone and earphone in our discussion because they have very low profit margin and a highly competitive market which make it unattractive to investors. Furthermore, earphones and headphones can hardly be classified as electronic products. In 1988, Hong Kong sold 16,116,539 units (HK$ 2,168.383 million) of portable cassette recorders and 1,514,997 units (HK$ 761.753 million) of Integrated Hi-Fi units[3] and in 1989, Hong Kong exported a total of HK$1,250.3 million's worth of radio-broadcast receivers of all kinds.[4]

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3. 1988 Survey of Industrial Production, Hong Kong: Census and Statistics Department, Table 15, p. 22.

4. Hong Kong External Trade, Hong Kong: Census and Statistics Department, December 1989, Table 6, p. 9.

There are numerous manufacturers in this industry concentrating on different products, creating an almost perfectly competitive market. There is, however, an exception in car radio manufacturing where market is dominated by one single supplier. Most of the manufacturers are OEM suppliers building products bearing more well known brand names.

Major markets for Hong Kong's audio industry include Europe, US, and South America[5]. Europe is the customer for high-end products whereas US and South America are customers for low end products. Audio equipment customers in Europe are usually more concerned about the quality and durability of the product while US customers are more concerned about the price.

As to product innovation, Hong Kong is basically a market follower behind the leaders (Japanese and some well know European brands) usually by one to two years. Because Hong Kong manufacturers are unwilling to invest in research and development, all they can do is to wait until the market leaders release a product and then copy or wait until they sell their technology to outside manufacturers.

Two major types of visual equipments are manufactured in Hong Kong. They are television sets (colour or black and white) and video cassette recorders (VCR). There are very few players in the TV market and most of them are OEM manufacturers.

As this is a relatively new market in Hong Kong, annual output (in terms of units) has not yet catch up with the other electronic products but it has been experiencing steady growth especially in TV set production. In 1988, Hong Kong sold 1,613,363 units of colour television sets, a total of HK$ 1,075.99

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5. Hong Kong Trade Statistics, Domestic Exports and RE-exports, Hong Kong: Census and Statistics Department, August 1990, Table 20, pp. 133-134.

million's worth[6] and in 1989, Hong Kong exported HK$ 1,557.6 million's worth of TV receivers to other countries.[7] The US, Europe and mainland China are all major customers of Hong Kong's visual equipments.

Computer Industry

Personal computers, mini computers, mainframes, workstations, and related peripherals are products in this category. Hong Kong does not have the technical know-how to produce mini/mainframe computers or workstations. Personal computers, IBM compatibles in particular, and peripherals are therefore the major concerns.

In 1988, there are altogether 111 factories engaged in computer products manufacturing[8] and they sold a total of 132,760 units of personal computers (mainly IBM compatibles) in the same year.[9] This industry has been enjoying a stable growth for the past few years for several reasons. First, there has been an increase in the number of PCs (PC is the well accepted abbreviation for personal computer) used at home. Second, there has been an increase in popularity of office automation; and third because some of the older models have already become obsolete in this extremely fast moving industry.

Major markets of the computer products include USA, Germany, Netherlands, Australia UK, Canada, and China.[10] In the beginning, Hong

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6. 1988 Survey of Industrial Production, Hong Kong: Census and Statistics Department, Table 15, p. 22.
7. Hong Kong External Trade, Hong Kong: Census and Statistics Department, December, 1989, Table 6, p. 9.
8. 1988 Survey of Industrial Production, Hong Kong: Census and Statistics Department, Table 19, p. 52.
9. 1988 Survey of Industrial Production, Hong Kong: Census and Statistics Department, Table 15, p. 22.
10. Hong Kong External Trade, Hong Kong: Census and Statistics Department, November, 1990, Table 8.

Kong only has the ability to produce OEM or copy others design (as a matter of fact, Hong Kong is still famous for producing fake PCs or what people refer to as IBM clones) but situation has been improving. After more knowledge has been acquired, Hong Kong is able to do some design of her own. Some manufacturers already have sales office set up in their major markets selling products bearing their own brand names.

Communication Equipments Industry

Many people have considered telecommunication as only telephone communication. This could be more or less true in the past but not anymore. Nowadays, when we talk about telecommunication, we should include both voice communication as well as data communication. Products falling into this category include telephone units, PABX[11], fax machines, modems[12], satellite receivers, multiplexers, concentrators, and other data communication equipments required to maintain a data network.

Major types of telecommunication equipments produced in Hong Kong include telephones (including classic telephone units, cordless phones, and mobile phones) modems, walkie talkie, and paging apparatus. Other products which are also found in Hong Kong include fax machines/cards, satellite receivers, small interface devices; etc. In 1989, Hong Kong exported HK$ 12,682.8 million of telecommunications equipments.[13] A large number of manufacturers are involved in this business with no dominant player in the

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11. Telephone line switching system used to share a small number of telephone lines with a relatively large number of users.

12. Modem is a piece of data communication equipment used to "modulate" and "demodulate" digital signals so that it can be transmitted in analogue form over a long distance.

13. Hong Kong External Trade, Hong Kong: Hong Kong: Census and Statistics Department, December, 1989, Table 6, p. 9.

scene except for mobile phones. Some of the larger telephone producers also produce small keying systems along side with telephone production. Mobile phone markets are basically dominated by a few large enterprises. Major customers of Hong Kong's telecommunications equipment include USA, Europe, and China.[14] Since data communication is becoming more and more important nowadays, we will focus on telephone units, modems, and fax equipments in this report.

Electronic Toys Industry

Three major types of electronic toys are manufactured in Hong Kong. They are remote control toys, hand held games, and TV games. Among these, there is a new class of electronics toys which emerged in the past ten years or so and it is the educational toys. Of course, there are others like talking dolls which are getting more popular but these products have not yet become dominant players in the scene.

In 1988, there are altogether 108 electronic toys manufacturer in Hong Kong[15] and they sold a total of 8,831,506 units(HK$ 615.884 million) of radio/sound controlled toys and 13,811,439 units (HK$ 792.254 million) of electronic games in that year.[16] There are no market leaders in Hong Kong in the production of remote control toys and hand held games. But, there is a market leader in educational toys - Video Technology. However, its position is now becoming more shaky as more firms enter the market. Major markets of

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14. Hong Kong Trade Statistics, Domestic Exports and Re-exports, Hong Kong: Census and Statistics Department, August 1990, Table 20, p. 138.
15. 1988 Survey of Industrial Production, Hong Kong: Hong Kong: Census and Statistics Department, Table 19, p. 52.
16. 1988 Survey of Industrial Production, Hong Kong: Hong Kong: Census and Statistics Department, Table 15, p. 22.

Hong Kong's electronic toys include the US, Europe, and China.[17]

In general, the hand held games market has been declining since the early eighties, after a short boom. Remote control toys has not been doing any better. The educational toys sector which has commenced late has been doing very well in the past few years but growth is now levelling off. Furthermore, demand for toys is seasonal. For example, demand may surge during Christmas period.

Electronic Household Appliances

There is a whole list of products which fall into this category. This include big ones like refrigerators, air conditioners; etc and small ones like irons, food processors, hair dryers, heaters; etc. Among all these, Hong Kong focuses on the production of those small household appliances. Previously, household appliances are basically electrical appliances. It is not until recently that electronics is introduced into these products.

In 1988, Hong Kong sold 10,309,615 units of food mixers, grinders, and juice extractors (HK$ 733.258 million) and 11,047,254 units of electric cooking apparatus (worth HK$ 726.353 million). There are 163 manufacturers engaged in the production of electrical appliances and housewares in the same year. Among all the units produced, only some of them are controlled by electronics circuitry. Data for electronics controlled household appliances alone are not available. Because electronics has only been newly introduced into household appliances, it has not been widely used. Therefore, market for electronic household appliances is still limited. Major markets include the US, Canada, Europe (Germany, France, Italy, and the Netherlands in particular)

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17. Hong Kong Trade Statistics, Domestic Exports and Re-exports, Hong Kong: Census and Statistics Department, August 1990, Table 20, pp. 235, 238.

Australia, China, and Japan.[18] In this industry, brand name is critical to the sales of a product. Since it is very difficult to build up a new brand name, most of the manufacturers in Hong Kong are OEM suppliers.

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18. Hong Kong Trade Statistics, Domestic Exports and Re-exports, Hong Kong: Census and Statistics Department, August 1990, Table 20, pp. 145-147.

CHAPTER III

PRODUCTION

There is, in effect, very little production going on in Hong Kong. Most of the manufacturers have production plants in mainland China to take advantage of the low wage rate and rent/property cost. A comparison of the wage rate and the lease rate between Hong Kong and China is shown in Appendix II. Hong Kong only acts as a general office where functions like material sourcing, engineering, and shipping are carried out. Very often, a significant proportion of the assembly process is completed in China where Hong Kong is only responsible for the final packing so that the "Made in Hong Kong" label can be attached onto the product. It is getting more popular now that the entire product is "Made in China" and exported as such. There are also complete production lines in China which one can rent for a certain period of time to complete an order. Businessmen who do not want to invest in China also use this method for longer term production.

Audio Visual Industry

Audio equipment manufacturing is a relatively labour intensive industry and some skills are required from the operator in order to have an "up-to-standard" product.

As to television manufacturing, major components are imported and then shipped to China for assembly. Manufacturing of television is also a

labour intensive industry and labour skill is important in the production process.

VCR manufacturing is not as labour intensive as TV production and does not require as much skill. Production are mainly on OEM basis. Usually components are imported from Korea in the form of CKD (complete knock down) and then shipped to China for assembly.

Computer Industry

Production is mainly carried out in China. Manufacturers are now also considering setting up factories in Eastern Europe to avoid protectionism in European countries. Factories often face a very short delivery lead time. As a major part of the assembly process is already very standardized, little skill is required from the operator. Very often, machines are used to aid production. Surface mount technology is widely used in this industry.

Communication Equipments Industry

Production is mainly carried out in China. For ordinary telephone sets, labour skill is not an important issue in production. Production process can be considered as simple. Production of modem is equally simple except for high speed (19.2K baud rate) modems. Nowadays most of the modem functions are integrated in standardized modem chips and this highly facilitates production. However, if the manufacturer is in the cordless phone business, labour skill is crucial to the quality of the product. Not many manufacturers are involved in fax machines production. Most of them are only producing fax cards which can be used together with PCs. Production of these fax cards is not very demanding either.

Electronic Toys Industry

Like all the other electronics industries, the electronic toys products are mostly assembled in China. Some of the manufacturers are also moving their production plants to Thailand and Malaysia. The production process of electronic toys is much simpler than most of the other electronics products except for some of the CPU[19] based educational toys. Labour skill is relatively unimportant. Manufacturers in this industry are not only OEM suppliers. Some of them also design their own products.

Electronic Household Appliances

The production of small electronic household appliances is simple and therefore very little training is required for the operators. The main electronic component is a custom designed chip which contains all the software commands. A major part of the product are mechanical parts (plastic or metal). Other commonly used components include heaters and small motors. Most of the production are carried out in China on an OEM basis.

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19. CPU is the industry accepted abbreviation for central processing unit.

CHAPTER IV

BARRIER TO ENTRY

There are six major sources of barriers to entry. They are capital requirement, government regulation, product differentiation, economies of scale, switching costs, cost disadvantages independent of scale, and access to distribution channel.[20] Since this report is mainly concerned about the manufacturing side of the electronics industry, the first four issues are relatively more important and are discussed in the following sections.

Capital Requirement

There are certain requirements which are common to all industries. These include property cost (including basic furnishing) and labour cost. Therefore, these cost will not be considered separately unless the product needs an extraordinary large plant. There are also some equipment requirements which are "must" in electronics industries; for example, oscilloscopes and soldering irons. These will not be considered either. In the following section, we will discuss what the special requirements pertaining to that particular industry are.

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20. Porter, Michael E.. Competitive Strategy: Techniques for Analyzing Industries & Competitors, New York: The Free Press, 1980, pp. 7-17.

Audio Visual Industry

Equipment requirement for audio product manufacturing is not very high. All that is needed include a central signal pattern generator (ordinary quality), a screen room with appropriate test equipments (ordinary standard) and a marker swift generator. All these equipment together will cost less than half a million Hong Kong dollars. Second hand equipments which are much cheaper are also readily available in the market. Audio equipment manufacturing usually does not require a very large plant. Most of the audio equipment manufacturers in Hong Kong are small to medium size factories. Production plants in China may be substantially bigger. Taking all these into consideration, capital requirement for setting up a small audio equipment factory can be considered as relatively low.

For TV set production, capital requirement is high because sophisticated equipments are need. Disregarding all the basic needs, equipment cost amount to about four million Hong Kong dollars. List of equipment required and their estimated cost are shown in Appendix III. Apart from these equipment, a large production plant is also needed and this too adds to the capital requirement. With such high capital requirement, economies of scale becomes an important issue. Small factories rarely have a chance to survive in this industry. Since we have assumed that the investor has only HK$ 1 million, Television manufacturing is out of the question. Therefore, this subject will not be discussed any further.

On the other hand, VCR production requires much lower capital investment when compared to television production. Apart from the basic requirements, all it needs are several test tapes at negligible price, a test tape fall out analyzer which costs about HK$ 1 million and several monitors at

several thousand Hong Kong dollars each. It does not need a large production plant either.

Computer Industry

Although PC manufacturing does not require a large production plant, equipments alone already cost about HK$ 600,000. Peripheral manufacturing is slightly less demanding. A list of equipment required and their estimated cost is shown in appendix III.

Communication Equipments Industry

Capital requirement for the manufacturing of ordinary telephone sets is not high. Large production plant is not necessary. Equipment cost is around HK$ 150,000. Requirement for the manufacturing of modems is even less. The only piece of extra equipment is a modem tester which cost about HK$ 100,000. Requirement for fax equipments is expected to be similar to telephone.

The cordless phone has a higher capital requirement. Apart from all the equipments needed in traditional telephone set manufacturing a field strength meter and a screen room (with relevant equipment) are needed. This adds another HK$ 500,000 to the capital cost. Mobile phone is even more demanding. On top of the equipments required for telephone set production, other very expensive equipments are also needed (a list of equipment required and their estimated cost is shown in appendix III). The extra equipment cost totaled to about four million Hong Kong dollars. Since capital requirement for mobile phone production is far beyond the investor's budget, it will not be included in later discussion.

Electronic Toys Industry

Low capital requirement is envisaged in the production of hand held games and most educational games. The most important electronic component of the product is the chip holding the program. Some design charge is incurred in the development of the chip but the cost is relatively low when compared to expensive equipment cost. However, if the manufacturer is producing their own plastic parts, cost of moulding machines has to be counted as well.

Remote control or be more specific, RF (radio frequency) control toys require more investment in equipment. Since it operates with RF, it requires the same type of equipment as in radio manufacturing but with a much lower standard.

Electronic Household Appliances

The capital requirement for electronic household appliances is low. Relatively little equipment cost and minimal development cost are required. Major development involves the design of the custom chip. Even so, its design is still considered as simple when compared with other electronic products. Capital requirements for those manufacturers who would like to produce their own plastics parts can be considerably higher. These manufacturer have to pay for the expensive moulding machines. For this type of products, plastic parts take up a significant proportion of the component count.

From the above analysis, we can see that low capital requirement is applicable to the electronic toys industry and electronic household appliances.

Slightly higher capital requirement is needed in the audio industry (low end product range), communication equipments industry (low end product range), and computer industry. Production of television, mobile phone, and cordless phone require very high capital investment which the investor in this report cannot afford. Therefore these industries will not be further discussed in this report.

Government regulations

Apart from the standard safety requirement on all electrical goods which has to be connected to the mains supply (UL in the USA and JIS in Japan), products which transmit radio frequency or in general, any equipment which can generate interference has to pass through radiation test. These include radios and radio frequency controlled equipments, televisions, computers, and telephone sets. The radiation standard in the US is called FCC and the radiation standard in Europe is called CISPR (different countries in Europe may have different standards but CISPR is the most popular. If a product can pass CISPR, there is a very high possibility that it can pass other European standards, may be except Italian Amsblat). Equipments which can generate interference are not allowed to be shipped to these countries without the appropriate approval.

There are also government regulations governing the import of communication equipments. The more sophisticated the equipment the more stringent is the law. Furthermore, different countries may have different rules/regulations on communication equipments.

Getting these approvals can be very tedious. It requires experienced electronic engineers to design the product as well as good industrial engineers to closely monitor production before a product which passes through those tests can be built. Furthermore, special laboratory is required

to carry out the tests and there are very limited number of laboratories in Hong Kong which are certified to do so. The local test results only serve as an indicator and real approval has to be granted by the country setting the rules. Cost incurred in each test is not cheap either. Hence, getting these approvals can be a problem to smaller firms which lacks the expertise as well as money.

As for toys, there are also safety standards which must be fulfilled. ASTM is the toys safety standard in the US and EN71 is the standard in Europe.

Product differentiation

Audio Visual Industry

As most of the manufacturers are OEM suppliers for low end products, there are little product differentiation. Customer loyalty is also minimal. Buyers usually picks the manufacturer who offers the lowest price provided their product meets the buyer's minimal quality requirement. For high end products, situation is slightly different. Customer requirement is more difficult to meet and sophisticated equipment, which are expensive, are needed in order to achieve the required quality. In this case, only bigger factories are qualified to produce.

Computer Industry

Computer products, especially PCs and its peripherals have almost become very standardized (PCs performance are basically the same provided that they conform to industry standard) and price cutting is usually the means for getting more orders. This is especially true for OEM manufacturers. For manufacturers marketing their own brand names, product differentiation may

be slightly more important because brand name is important to PC sales. The major competing issues are speed, size, and compatibility. As production processes are already quite standardized, customers can easily switch from one supplier to another. Therefore there is very little customer loyalty in this business.

Communication Equipments Industry

Little product differentiation can be found in classic phones and cordless phones. Major product differentiations are found in the style of the telephone unit and the extra features added which can be quite trivial sometimes. Users may purchase a telephone simply because of its style rather than its performance. Unfortunately, style can easily be copied.

Major product differentiation in modem is its degree of reliability in data transmission and its speed. Both of these are important issues in data communication and are not easy to achieve.

Electronic Toys Industry

There is very little product differentiation in the remote control sector. Everything is almost standardize. With electronic games and educational toys, product can be quite different if manufacturers are selling their own design. The product depends very much on the software written for it. New and interesting features are also very important in attracting customers.

Electronic Household Appliances

Since manufacturers are not selling their own design, there is little product differentiation. Quality is a major concern of the customers but it is relatively easy to achieve as household appliances are not sophisticated products. Hence customer loyalty is almost non-existent.

As a whole, we can say that there are very little product differentiation in the electronics industry because most of the manufacturing are on OEM basis. However, situation is gradually changing as more manufactures are starting to market their own design. The electronic toys industry (particularly educational toys) and computer industry are leading the others with respect to marketing their own design.

Switching Cost

Switching cost in electronics industry as a whole is very low. One of the reason for this is that Hong Kong does not have the ability to produce "hi-tech" products which require substantial technical support or training from buyer. Furthermore, most of the production are on OEM basis which means that the product design belongs to the buyer. This makes it even easier for the buyer to switch supplier. There may be certain sectors in the electronics industry where higher switching cost are envisaged. These are usually industries which require high capital investment and good technical support; for example mobile phone, which the investor in this report does not have enough capital to invest in.

Economies of Scale

Economies of scale certainly is a barrier to enter an industry. However, it is not an important factor in most of the electronics industries and the extent of its effect varies from one industry to another.

In the audio industry, economies of scale is not important as this is basically a labour intensive industry. Electronic components and labour cost occupy a major proportion of the product cost. Therefore, there cannot be a significant decrease in production cost by maintaining a large output. The same holds true in VCR manufacturing.

Economies of scale plays a more important role in the computer industry. This industry is not as labour intensive and the use of machine to aid in production is quite popular. Economies of scale takes effect when the machine operating cost drops with the increase in unit production.

The communication equipments industry is more like the audio industry than the computer industry. Economies of scale does not have a very prominent effect in this industry.

As to electronic toys and electronic household appliances, economies of scale can be very important. Because plastic parts occupy a major proportion of the BOM, costs of moulds plays a significant role in determining the cost of production. The more units the company produces, the less per unit cost is the plastic parts. Similar theory applies to moulding machines as well. If the manufacturer is producing its own plastic parts, the more it produce, the less is its moulding cost.

CHAPTER V

COMPETITION

The state of competition in an industry basically depends on five competitive forces. They are existing competitors, potential entrants, substitutes, bargaining power of suppliers, and bargaining power of buyers.[21] This section will focus on competition among existing firms.

Audio Visual Industry

Japan is one of the biggest audio equipment supplier in the world. However, they are focusing more on the high end products which is not something Hong Kong excel in. The biggest competitor in Asia is Taiwan which also focuses on low end OEM products. South East Asian countries are also competitors in the low end range.

Within Hong Kong, competition is very keen. Manufacturers often lower their price in order to gain market share. Recently, competition has heightened further because many Taiwanese are coming to Hong Kong to set up their office in order to take advantage of the cheap labor cost in China (Taiwanese are forbidden by the Taiwan government to trade with China directly).

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21. Porter, Michael E.. Competitive Strategy: Techniques for Analyzing Industries & Competitors, New York: The Free Press, 1980, pp. 3-5.

There are many VCR manufacturers in Hong Kong competing for market share. Competition also comes from other South East Asian countries and Taiwan. Price is usually what they use to compete with.

Computer Industry

Within Hong Kong, competition is keen and no single manufacturer can dominate the market. Outside Hong Kong, competition comes from Japan, Taiwan South Korea, and Singapore. Both Japan and Taiwan exported more than two million units (PC) each in 1988. Other competition within Asia which are recently getting more aggressive include Malaysia, Thailand, and India.

Communication Equipments Industry

In Hong Kong, competition in traditional telephone set is keen. The situation in in-house cordless phone and modem is slightly better. Competitors of these products outside Hong Kong include Taiwan, South Korea, and Japan. The market for fax machine is dominated by Japan and only few manufacturers are attempting to enter this market.

Electronic Toys Industry

Competition in the hand held games and remote control toys field is very keen within Hong Kong. Major overseas competitor in hand held games is Japan and for remote control toys, Taiwan and Japan are the key competitors. South Korea is also emerging as a competitor in remote control toys. Although the educational toys market had not been very competitive in the past, it is becoming so with increased competition from local manufacturers and overseas manufacturers in South East Asia. Within Hong

Kong, there is a market leader in the educational toys field. Previously the market leader held about 50 percent of the market share in USA. With the recent increase in competition, its market share in USA has dropped to about 30 percent.

Electronic Household Appliances

There are strong competition from within Hong Kong and overseas. Major overseas competitors include South Korea, Japan, and other South East Asian countries. Price is usually the means of competition. Because production of electronics household appliances is so simple, switching cost for a buyer is almost non-existent and this heightens the degree of competition. Recently, it has become very popular for audio equipment manufacturers in Hong Kong to move into electronic household appliances manufacturing as well.

From the above, we can see that competition is keen in almost all the sectors within the electronics industry except for those which require high capital investment. Since only big companies can afford to enter those high capital industries, the number of players are limited and competition is therefore not as keen as the other sectors.

CHAPTER VI

PROFIT MARGIN

Data in this section is collected from interviews or calculated from government publications. In this report, profit margin is interpreted as net earnings divided by total sales. All the calculations are performed using this formula.

Audio Visual Industry

Profit margin has been declining in the audio industry because the completed product price has been dropping while component cost has been increasing, especially for discrete components. Situation is however better for high end products which usually have a higher profit margin. The average profit margin for transistorized radio in 1988 is around 10 percent and the average profit margin for sound reproducing and recording equipment in 1988 is around 22 percent.[22]

Profit margin for VCR is low because of keen competition. According to some the manufacturers, export of VCRs to Europe and US is no longer profitable but sales to mainland is still considered as a good business. Some people even think that the VCR as it is now, is already a declining product

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22. Calculated from Table 19 in the 1988 Survey of Industrial Production, Hong Kong: Census and Statistics Department.

because of the introduction of the laser disc player and also because most of the homes in US and Europe already have VCRs.

Computer Industry

Profit margin of computer equipments has been very good in the early stage but has been decreasing with the declining sales price. The average profit margin for computing machineries and equipments in 1988 is around 19.4 percent.[23] Computer prices are expected to continue to fall in the next few years.

Communication Equipments Industry

The industry had enjoyed high growth rate in the late seventies and early eighties but growth has gradually levelled off in the past few years. Profit is still very good for high end/new products like mobile phone and cordless phone whereas profit margin for ordinary telephone sets are low (a profit margin of 20 percent is already considered as very good). Profit margin of modem is no better. As to satellite receivers, because they are usually produced on an OEM basis, profit margin can only be maintained at 20 percent to 30 percent level even though there are only a few manufacturers in this business. With OEM production, the buyer usually demands a complete breakdown of the component cost, labour cost, and overhead cost; therefore, profit margin is limited.

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23. Calculated from Table 19 in the 1988 Survey of Industrial Production, Hong Kong: Census and Statistics Department.

Electronic Toys Industry

The average profit margin in 1988 was around 22.6 percent[24] but it has been declining especially for hand held games and RF control toys. An RF control toy car which costs about HK$ 400 several years ago is now only charging for around HK$ 100. On the other hand, educational toys manufacturers are still enjoying a high profit margin although it has already faced a significant decrease. Two years ago, profit margin for educational toys can easily reach 300 percent, especially for new products. Now, profit margin has already dropped to an average of 150 percent. This figure is expected to continue to drop as more competitors enter the market and when manufacturers run out of innovative ideas. Furthermore, if we compare the profit margin of educational toys with the average profit margin of the electronic toys industry, we can imagine how low the profit margin of the other electronic toys can be.

Electronics Household Appliances

Profit margin has been declining as more and more competitors enter this field. The average profit margin of this industry in 1988 was around 22.2 percent.[25] The 1990 figure is not available but according to some manufacturers an average of 15 percent is now the normal rate.

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24. Calculated from Table 19 in the 1988 Survey of Industrial Production, Hong Kong: Census and Statistics Department.

25. Calculated from Table 19 in the 1988 Survey of Industrial Production, Hong Kong: Census and Statistics Department.

CHAPTER VII

FUTURE TREND OF THE INDUSTRY

Audio Visual Industry

Audio manufacturers are moving towards higher end products like table top mini music centre for higher profit margin. Apart from this move, manufacturers are also looking for new markets like Eastern Europe and China which have an appetite for low end products. Some of them are even trying to establish their own brand names and try to narrow their gap with Japan.

The latest innovation in this market is the introduction of digitization. Many firms start to invest in this technology and try to enter this market because of the high profit margin expected.

Like the audio industry, visual equipments are also going digital. The latest hot item is the HDTV (high definition television) and with it comes the new VCR or laser disc player.

Factory owners engaged in video equipment manufacturing are also looking for production centres outside China. Places usually under consideration include South East Asia and Europe. Some manufacturers are looking for further cost cuts in South East Asian countries where wage rate are even lower than China and some would like to get around the anti dumping law by setting up factories directly in Europe.

Computer Industry

After the surge in demand when PC is first introduced into the household and when the 386 PC is launched, growth in the PC market has slowed down as the market matures. However, it is still expected to maintain a growth rate of 11 to 13 percent in the next five years.[26] Countries which have lagged behind in PC usage will continue to catch up with the leading users. Obsolescence of the installed base will also become a market driver. Growth in the popularity of automated information system may also help to expand the computer market. New use of the PC will be found in configuring them to run on a network or as a multiuser system connected to workstation.

As to the product itself, user will be looking for better processing power, higher speed, and smaller size. Ease of use, connectivity to network, and compatibility to universal standards will also be major concerns. More focus will be put on the portable segment (laptop, notebook, and hand-held). "The portable segment is expected to provide most of the PC market growth."[27] The introduction of the i486 (a microprocessor used in PCs as the central processing unit) provides the continual improvement in speed performance. However, it is not expected to provide the same surge in demand as when PC is introduced to domestic use or during the transition from XT to AT.

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26. Joseph Lung, "Overview and Forecast on the PC market", Electronics Bulletin, Vol. 10, No. 1, p. 73.

27. Joseph Lung, "Overview and Forecast on the PC Market", Electronics Bulletin, Vol. 10, No. 1, p. 74.

Communication Equipments Industry

Products in this industry are getting more complicated and sophisticated. Transmission speed will continued to increase and digital transmission will become the future standard.

Less developed countries in Asia trying to catch up with the others in communication will become potential customers in traditional telephones. More features, for example, video image, fax, radio; etc, will be integrated into a single telephone unit.

Demand for modems is expected to grow at a steady pace in the next few years because people are paying more attention to the importance of information technology. Thereafter, modem will gradually fade away with the introduction of ISDN (integrated service digital network). At present, the telephone network can only transmit voice (which is analogue) signal. With ISDN, both voice and data (in digital form) can be transmitted by one single telephone line. By then, modems which is needed in analogue data transmission will become obsolete.

The introduction of ISDN will also bring about a new generation of "telephones". These new telephones will not only handle analogue communication but can also take the place of modem and handle the transmission of data, like computer files, from one station to another.

Electronic Toys Industry

More digital technology will be used in future designs. New features like voice recognition will be incorporated into future products. More complicated control will also be implemented and higher technology requirement is envisaged. The future of the electronic toys industry depends

very much on the economic situation, especially the US economy. If there is a fast recovery in the US economy, the electronic toys industry will boom. Unfortunately, this may not extend to the RF controlled types which market has already saturated.

Electronic Household Appliances

The electronic household appliance is expected to expand as it gains greater market acceptance. Suppliers are expected to focus more on user convenience and safety/precaution measures in the future (an example is the cordless appliance). More features will be added to those once simple household appliance (for example, automatic water level sensing in irons). Some people are even talking about intelligent homes where all the appliances inside the house are controlled by a central control unit (for example, a computer). Like the electronic toys industry, the future of this industry depends very much on the economic situation, especially US and Europe. The low end product range also sees possible expansion in Eastern Europe and China as these markets gradually open up.

CHAPTER VIII

PROBLEMS FACING INDIVIDUAL SECTORS OF THE ELECTRONICS INDUSTRY

Audio Visual Industry

There are two major problems facing the audio industry. The first one is the quality of the product. Since most of the manufacturing is done in mainland China, it is difficult to control the quality while maintaining the cost low (especially for low end products where profit margin is narrow). The second is the lack of engineers who are proficient in digital audio. This is a rather new concept and very few engineers have enough exposure in this area.

Major problems that the video equipment industry is now facing include:

1. Major components (for example, VCR decks) are all imported and supply is limited. This hinders the growth of the industry.
2. The introduction of HDTV implies the introduction of a new technology and also new standards. However, no body knows what the future standard will be and this uncertain situation is difficult to cope with. Japan has started on the product long ago and has already established a standard. On the other hand, US and Europe who do not want to follow Japanese standards are also trying to set up their own standards even they have started late.

Computer Industry

There are several problems the industry is now facing:

1. The 1997 issue has an especially important effect in this industry. Manufacturers worry that after the return of Hong Kong back to China, hi-tech components like the i386 or i486 microprocessor (the "i" in i386 and i486 stands for Intel, an American IC manufacturer), which are the "hearts" of PCs, will not be allowed to ship to Hong Kong. The US and some Western European countries have laws forbidding the shipment of hi-tech products to communist countries.
2. This is an extremely fast moving industry. In the early stage, Hong Kong can still drag along by copying. But, with the advance in technology, it is becoming more and more difficult to keep in pace with the market leaders in US, Europe, and Japan given the minimal support from the Hong Kong government in R & D.
3. Introduction of new standards (like PS/2 and Unix operating system) also poses problems to the industry. Manufacturers find it difficult to plan for the future as no body knows what the future "market standard" (at present, IBM PC, XT and AT is more or less the market standard for PC") will be.
4. Lack of expertise in software support is another problem in the industry. Computers does not run by itself nor does the peripherals. They need software (commands) to instruct them what operation to execute. Without the necessary software support, this industry will not be able to grow healthily.
5. Difficult to keep good engineers in this field. They tend to switch jobs frequently.

Communication Equipments Industry

There are several major problems bothering the telecommunications equipments industry:

1. It is an extremely fast moving industry and it is very difficult for Hong Kong to catch up without strong government support.
2. It is difficult to get good engineering support in Hong Kong especially when more advanced telecommunication technology is involved.
3. With the advance in telecommunication technology, people are getting more worried about availability of hi-tech components after 1997.

Electronic Toys Industry

Major problems in the electronic toys industry are:

1. Apart from being seasonal, the demand for electronic toys is very sensitive to economic condition. The industry will be hit first when there is a down turn in the economy.
2. Orders received from customers are usually short orders and therefore material control is very important in the operation. Poor material control leads directly to decrease in profit.
3. The product has very short life span. They usually become obsolete in two to three years. In order that a company can stay in business, continual innovation is necessary.
4. Tight regulations/standards are imposed by overseas governments (especially US and Japan) on toys.

5. For those manufacturers who are selling their own design, their products can easily be copied by others. Patents on designs are seldom heard of in this industry.
6. Demand is seasonal. Manufacturers must cater for the vast fluctuation in demand when planning production.

Electronic Household Appliances

Several problems exist in the electronic household appliances industry:

1. It is very sensitive to economic situation. Because they are not necessities, the market will be hit hard when there is a down turn in the economy.
2. It is a fast moving industry. Product usually becomes obsolete in two to three years time.
3. To the marketing people in this business, the most difficult problem is how to attract consumers to purchase what they already have. For example, most households already have an electric iron and therefore it is very difficult to sell them an electronics controlled, intelligent iron with some additional features which may be trivial to its operation.

CHAPTER IX

DISCUSSION

In order to decide which sector to invest in, we have to consider all the issues we have discussed so far. Performance of each sector against every issue is shown in an matrix in Appendix IV. This matrix summarizes the capital requirement, production requirement, technology requirement, competition, government regulations, profit margin, problems, and future trends of each individual industry. Because we are limited to a capital of one million Hong Kong dollars, television and mobile phone have been automatically deleted from our list. Although capital requirement for VCR is within our HK$ 1 million budget, its requirement is too close to our limit which leaves us no room for reserve. Therefore, it will be dropped as well.

Competition is keen in every sector except for those industries which require high capital investment. Therefore, we will face severe competition no matter which sector we invest in since we do not have the required capital to enter those "expensive" industries.

High profit margin is of course desirable. Mini combo hi-fi, cordless phone, modems, and educational toys can all fulfill this requirement.

For a beginner, easy production and low technology requirement will certainly help. In this case, telephone, modems, electronic toys, and household appliances suits both needs.

To play it save, it is also advisable to invest in an industry which has the least problems or the problems are relatively easy to solve. Taken this into consideration, electronic toys and electronic household appliances seem to

be the right candidates. These two industries does not face so much unknowns about the future as does audio equipments, computers, and telecommunication equipments. Their major concerns are how to increase their sales and how to maintain smooth production. The need for continuous innovation does not only pertain to these two industries. It is relevant to all electronics industries owing to their rapid changing nature.

For short term cashing out, we should invest in educational toys. The product is easy to "imitate" and the profit margin is high. With little technical requirement and simple production procedure, production can be started within a relatively short period of time. Furthermore, little development cost is required to develop new products which can help us to gain market share.

As an alternative, electronic household appliances is not a bad choice since it has similar qualities to electronic toys. However, we should not focus on electronic appliances alone. We should be more flexible and enter the electrical household appliances market side by side with electronic appliances. The reason for this is because electronic household appliances are still in the developing stage and market is limited.

If we look further into the future, we will definitely see market expansion in the computer industry and the telecommunications equipments industry. As to the other industries, it depends very much on economic situation and new product innovation. Market may grow if the economy booms or it may become stagnant or even shrink if the economy turns bad. New product innovations will always help to boost market growth but it also depends on whether the new idea can gain general market acceptance and replace old products.

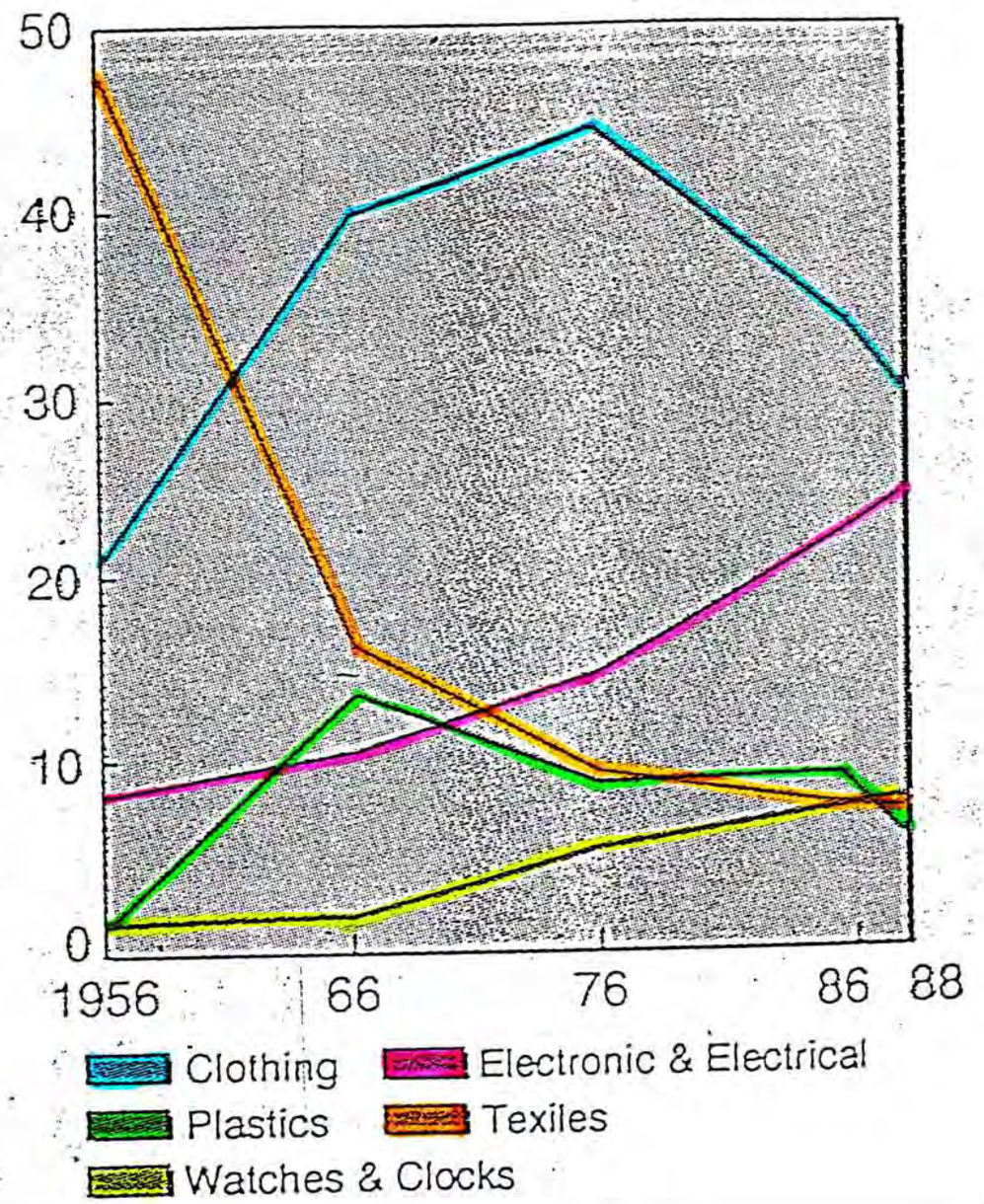
For longer term investment and future expansion, we should enter the telecommunication industry. Markets will expand when the less developed countries pick up on telecommunication technology. As a start, we should begin with telephone and modem manufacturing. Although these products

have a low profit margin, production is relatively simple and technology requirement is low. Cordless phone is not considered because it requires much higher equipment cost and production skills. As to the fax market, it has already been dominated by the Japanese and it will be too difficult for new investors with limited capital to compete. Meanwhile, we should also start to develop interface to ISDN. As ISDN gains its way to more countries and become more popular, a brand new market will open up. This market is expected to expand until all the countries which are more advanced in telecommunication have fully upgraded to the new system.

As a conclusion, the author will advise the investor to start with electronic toys because of its low capital and technical requirement and also because of its ease of production. After cashing out in the electronic toys industry, the investor should diversify into the communication equipments field. This is the area where continual growth can be seen in the future and new opportunities will be opened up with the introduction of new communication technology.

Appendix I

Changing Share of Hong Kong's Exports



Source: SRI International Projects Team. "Building Prosperity: A five-Part Economic Strategy for Hong Kong's Future" September, 1989.

Appendix II

A Comparison of Wage and Rent in Hong Kong and China

	Hong Kong	China
Average yearly employee compensation in 1988 (Manufacturing of electrical and electronics consumer products)	HK$ 50,900*	N/A
Operator salary (per month)	HK$ 4242 (average)	HK$ 500-800
Rent per square foot (rough estimate based on information from interviewee)	HK$ 6-12	HK$ 0.7-1.2

* Calculated from 1988 Survey of Industrial Production, Hong Kong: Census and Statistics Department, Table 19, p. 53.

APPENDIX III

List of Equipment Required in various electronics Industry

List of Equipment Required in Audio Equipment Manufacturing

Equipment	Cost (HK$)
1. Central signal pattern generator	100,000
2. Screen room with equipment	300,000
3. Marker swift generator	10,000

Note: Only low to ordinary standard equipment is required. Therefore, price of equipments which seem to be the same as those used in other products, for example television, may be different.

List of Equipment Required in TV Manufacturing

Equipment	Cost (HK$)
1. Multi system signal pattern generator	600,000
2. Specially designed conveyer belt	2,000,000
3. Good quality screen room with equipment	1,000,000
4. Marker swift generator	10,000
5. Anti magnetic test equipment	8,000
6. High pot tester	10,000
7. Special packing equipment	30,000
8. Life test station for burn in test	500,000
9.Large production plant	

List of Equipment Required in VCR Manufacturing

Equipment	Cost (HK$)
1. Test tape fall out analyzer	1,000,000
2. Several test tapes	negligible

APPENDIX III (continued)

List of Equipment Required in Computer Manufacturing

Equipment	Cost (HK$)
1. 100M oscilloscope	15,000
2. Logic analyzer	100,000
3. Surface mount machine with 2 heads (5000 components per hour)	400,000
4. Flow solder machine	50,000
5. Conveyer belt with 20 positions	30,000
6. Several sets of software for testing	@ 3000
7. Copyright for operating system software	

List of Equipment Required for Traditional Telephone Manufacturing

Equipment	Cost (HK$)
1. Audio Signal generator	5,000
2. Telephone test set	100,000
3. Voice band transmission test set	30,000

List of Equipment Required for Cordless Phone Manufacturing

Equipment	Cost (HK$)
1. Audio Signal generator	5,000
2. Telephone test set	100,000
3. Voice band transmission test set	30,000
4. Field string meter	200,000
5. Screen room with equipment	300,000

List of Equipment Required for Mobile Phone Manufacturing

Equipment	Cost (HK$)
1. Audio Signal generator	5,000
2. Telephone test set	100,000
3. Voice band transmission test set	30,000
4. Several network analyzer	@ 1,500,000
5. Several high frequency signal generator	@ 1,500,000
6. Spectrum analyzer	500,000
7. Surface mount machine with 2 heads	400,000

APPENDIX IV

ELECTRONICS INDUSTRIES PERFORMANCE MATRIX

	Audio		Visual	
	Radio/cassette (portable)	Mini combo/mini desktop	Television	Video Casette Recorder
Production	Require some skill from labour but operation is not very difficult.	Require more skill than low end radio but is still considered simple.	Labour skill is required. Operation is not simple.	Low production requirement.
Capital requirement (exclude basic equip. like furniture and standard electronics equip.)	Less than HK$ 500,000.	More than low end radio but still within the HK$ .5 million margin.	Need high investment. Equipment alone cost around HK$ 4 million + large proudction plant.	Low. About HK$1 million is enough.
Technology requirement	Low	Relatively low but also depend on the quality of the product.	High	Low
Competition	Very keen from local and overseas manufacturers.	Not too keen but will be more keen when more manufacturers enter the market	Not keen within Hong Kong but severe in overseas competition.	Very keen in both domestic and overseas competition.
Government regulation	Safety and interference	Safety and interference	Straight on safety and interference.	Safety
Profit margin	Low	Cannot be considered as high but already higher than low end radio and is decreasing.	High	Low
Future	Moving towards higher end products.	Moving towards high end products. Digital technology will be used.	Introduction of digital technology.	Move towards digital together with television.
Problems	Lack of digital audio engineers. Product quality	Same as in radio.	Customers impose anti-dumping law. Uncertainty in future standard. Major components are all imported.	As in television.

	Telecommunications				
	Standard telephone	cordless phone	Mobile phone	Modem	Fax machine
Production	Simple	More complicated than standard telephone but not too sophisticated.	Complicated and depend very much on labour skill.	Simple but difficulty increase with speed of modem.	Simple for fax cards but more complicated for fax machine.
Capital requirement (exclude basic equip. like furniture and standard electronics equip.)	Less than Hk$ 150,000.	Around HK$ 600,000	Very high. At least 7 million Hong Kong dollars.	Around HK$ 100,000	Not too high
Technology requirement	Low	Not very high.	High	Low	not high
Competition	Very keen.	Not too bad.	Dominated by a few large enterprise.	Not too bad.	Dominated by Japan.
Government regulation	Safety	Safety	Safety	Safety	Safety
Profit margin	Low	Higher than traditional telephone set.	Very high.	Not high. Around 20%.	Not bad
Future	1. add more feature 2. digital transmission 3. higher transmission speed.	More features	1. getting smaller 2. better transmission	Higher speed	1. higher speed 2. smaller size
Problems	Uncetainity in future standard (digital circuit).	Difficult to get good engineering support.	1. availability of high-tech component after '97. 2. lack good engineering support.	Become obsolete with the introduction of ISDN.	Market already dominated by Japan.

APPENDIX IV (continued)

	Computer and peripheral	Electronic Toys			Household Appliances
		Remote Control	Hand Held Games	Educational	
Production	Not difficult	Simple	Simple	Simple	Simple
Capital requirement (exclude basic equip. like furniture and standard electronics equip.)	Estimated at about HK$ 650,000	Low	Low	Low	Low
Technology requirement	Not too high.	Low	Low	Low	Low
Competition	Very keen especially from overseas.	Very competitive	Very competitve	Not too keen but is getting more and more competitive each day.	Keen
Government regulation	Safety and interference	interference and regulation on toys.	Regulation on toys.	Regulation on toys.	Safety
Profit margin	Not bad but is declining	Very low	Low	High but declining quickly.	Low (10-15%).
Future	1. inc. processing power 2. higher speed. 3. smaller size. 4. network connectivity.	1. more complicated control. 2. voice recognition.	1. more complicated control.	1. more complicated control. 2. voice recognition. 3. digital technology.	1. user convenience. 2. add trivial features. 3. use of central control unit.
Problems	1. component supply after 1997. 2. lacking further and further behind. 3. unclear future std. 4. lack of tech. support	1. demand seasonal 2. very sensitive to economic situation.	1. demand seasonal 2. very sensitive to economic situation. 3. Short life cycle.	1. demand seasonal 2. very sensitive to economic situation. 3. short life cycle. 4, design easily copied by others.	1. very sensitive to economic situation. 2. short life cycle. 3. convince consumers to buy something they already have.

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